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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,806	08/30/2001	Andrew D. Bailey III	LAM1P124D1	4355
22434	7590	10/19/2004		
BEYER WEAVER & THOMAS LLP P.O. BOX 778 BERKELEY, CA 94704-0778				
			EXAMINER ALEJANDRO MULERO, LUZ L	
			ART UNIT 1763	PAPER NUMBER

DATE MAILED: 10/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/943,806	Applicant(s) BAILEY ET AL.	
	Examiner Luz L. Alejandro	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23,26,27,32,33 and 35-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23,26,27,32,33 and 35-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 23, 26-27, 32, 42-43, and 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al., EP 0 837 489 A2.

Collins et al. shows the invention substantially as claimed including a method for providing temperature control to a plasma processing chamber of a plasma processing apparatus, the method comprising: directly and indirectly measuring temperature internal to the plasma processing chamber 40 using a temperature sensor 76, for instance, to measure the temperature of the ceiling 52 and using a temperature sensor 79 to measure the temperature of the ring 62; comparing both of these temperatures to

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a target temperature (see page 12-line 54 to page 13-line 17); heating the plasma processing chamber by heating a thermal control block including a heater element 75 thermally coupled to the plasma processing chamber 52 through a conformal thermal interface 1090, a cooling element 74 (see figs. 18-19), and a thermal break 1085 (see figs. 20-21) that is thermally coupled and biased to the plasma processing chamber 40 (see page 13-line 55 to page 14-line 22); cooling the plasma processing chamber 40 by actively cooling the thermal control block 74,75, wherein there are layers (thermal break element) in the block separating the heating element from the cooling element (see Figs. 17A-23); and wherein the thermal control block further include notches (1000, 1020) through which gas flows and which prevent RF energy from coupling with the thermal control block (see figs. 18-19). Furthermore, note that the heating and cooling are provided through the same thermal control block 74,75 (claim 24).

Collins et al. fails to expressly disclose a plurality of thermal control blocks. However, a prima facie case of obviousness exists because the duplication of parts have been held to have been obvious (see *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960)). Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a plurality of thermal control blocks in the apparatus of Collins et al. because this allows for better controllability over the process being conducted in the apparatus.

Collins et al. fails to expressly disclose that the plurality of thermal control blocks are located around the sides of the plasma processing chamber. However, a prima facie case of obviousness exists because the rearrangement of parts have been held to

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have been obvious (see *In re Japikse* 86 USPQ 70 (CCPA 1950)). Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a plurality of thermal control blocks in the apparatus of Collins et al. because this allows for better controllability over the process being conducted in the apparatus.

Concerning claim 43, apparatus limitations, unless they affect the process in a manipulative sense, have little weight in process claims. *In re Tarczy-Hornoch* 158 USPQ 141, 150 (CCPA 1968); *In re Edwards* 128 USPQ 387 (CCPA 1961); *Stalego v. Heymes* 120 USPQ 473, 478 (CCPA 1959); *Ex parte Hart* 117 USPQ 193 (PO BdPatApp 1957); *In re Freeman* 44 USPQ 116 (CCPA 1940); *In re Sweeney* 72 USPQ 501 (CCPA 1947).

Claims 33, 35-41, 44-45, and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al., EP 0 837 489 A2 in view of Collins, U.S. Patent 6,572,732.

Collins et al. shows the invention substantially as claimed including a method for providing temperature control to a plasma processing chamber of a plasma processing apparatus, the method comprising: directly and indirectly measuring temperature internal to the plasma processing chamber 40 using a temperature sensor 76, for instance, to measure the temperature of the ceiling 52 and using a temperature sensor 79 to measure the temperature of the ring 62; comparing both of these temperatures to a target temperature (see page 12-line 54 to page 13-line 17); heating the plasma

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processing chamber by heating a thermal control block including a heater element 75 coupled to the plasma processing chamber 52 through a conformal thermal interface 1090, a cooling element 74 (see figs. 18-19), and a thermal break 1085 (see figs. 20-21) that is thermally coupled and biased to the plasma processing chamber 40 (see page 13-line 55 to page 14-line 22); cooling the plasma processing chamber 40 by actively cooling the thermal control block 74,75, wherein there are layers (thermal break element) in the block separating the heating element from the cooling element (see Figs. 17A-23); and wherein the thermal control block further include notches (1000, 1020) through which gas flows and which prevent RF energy from coupling with the thermal control block (see figs. 18-19).

With respect to claim 39, note that the heating and cooling are provided through the same thermal control block 74,75.

Collins et al. fails to expressly disclose a plurality of thermal control blocks. However, a prima facie case of obviousness exists because the duplication of parts have been held to have been obvious (see *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960)). Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a plurality of thermal control blocks in the apparatus of Collins et al. because this allows for better controllability over the process being conducted in the apparatus.

Collins et al. fails to expressly disclose that the plurality of thermal control blocks are located around the sides of the plasma processing chamber. However, a prima facie case of obviousness exists because the rearrangement of parts have been held to

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have been obvious (see *In re Japikse* 86 USPQ 70 (CCPA 1950)). Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a plurality of thermal control blocks in the apparatus of Collins et al. because this allows for better controllability over the process being conducted in the apparatus.

Collins et al. does not expressly disclose that the cooling is provided by the cooling element through the heating element, the thermal break, and the conformal thermal interface and into the chamber. Collins discloses a method for providing temperature control to a plasma processing chamber by which a cooling element 520 cools the chamber through heating element 510 that is in physical contact with a roof (147,400,110) (see figs. 26-29 and their descriptions). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Collins et al. as to perform the cooling through the heating element, the thermal break, and the conformal thermal interface because this is a suitable method for controlling the temperature of the plasma chamber. Additionally, the particular arrangement of the cooling and heating means, which will provide for the cooling through the heating member, would not lend patentability to the instant application without the showing of unexpected results.

Regarding claim 45, note that both the thermal break and the conformal thermal interface can be formed of a variety of materials (see page 15, line 50 to page 16, line 8 of Collins et al.). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine through routine

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experimentation the optimum thermal conductivity of the thermal break and conformal thermal interface based upon a variety of factors including the speed at which it is desired to control the temperature of the chamber or the desired thermal separation between the heating block and cooling element, and such limitation would not lend patentability to the instant invention absent the showing of unexpected results.

Concerning claims 44 and 48-49, apparatus limitations, unless they affect the process in a manipulative sense, have little weight in process claims. In re Tarczy-Hornoch 158 USPQ 141, 150 (CCPA 1968); In re Edwards 128 USPQ 387 (CCPA 1961); Stalego v. Heymes 120 USPQ 473, 478 (CCPA 1959); Ex parte Hart 117 USPQ 193 (PO BdPatApp 1957); In re Freeman 44 USPQ 116 (CCPA 1940); In re Sweeney 72 USPQ 501 (CCPA 1947). Moreover, note from fig. 20 of Collins et al., for instance, the presence of notches in the cold plate and notches in the hot plate overlying the coil such that the notches are parallel to each other.

Response to Arguments

Applicant's arguments filed 8/2/04 have been fully considered but they are not persuasive. Applicant argues that the cited element 75 in fig. 5 of Collins et al. EP '489 is not a heater element. However, the examiner respectfully disagrees since, for example, Collins et al. EP '489 discloses at page 13, lines 39-49 that the heat transfer material 75 may be heated.

Furthermore, applicant contends that a conformal thermal interface is not shown in the Collins et al. EP '489 reference which is in physical contact with the conformal

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thermal interface and the plasma processing chamber. In response, applicant is directed to reference number 1090 in fig. 20 which shows a conformal thermal interface in contact with the plasma processing chamber roof 20 and the thermal control block (74,75).

Concerning the limitations of employing resistive heating and spring biasing, apparatus limitations have little patentable weight in process claims unless they are shown to affect the process in a manipulative sense. Furthermore, although radiating heating is the preferred method of heating in Collins et al. EP '489, other well known types of heating such as resistive heating are not excluded. Note that disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (see *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971)).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the


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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 571-272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Luz L. Alejandro
Primary Examiner
Art Unit 1763

October 17, 2004